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## **If You're Happy and You Know It: Concentrate!**

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# BUTLER UNIVERSITY HONORS PROGRAM

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Thesis title If You're Happy and You Know It: Concentrate!

Intended date of commencement May 12, 2012

Read, approved, and signed by:

Thesis adviser(s) Jana J. Lineweaver 4/24/12  
Date

Reader(s) Alison L. O'Malley 4/24/12  
Date

Certified by Judith Mayer Morrel 11 July 2012  
Director, Honors Program Date

For Honors Program use:

Level of Honors conferred: University Cum Laude  
Departmental Psychology with High Honors  
University Honors Program

MOOD AND MIND WANDERING

**If You're Happy and You Know It: Concentrate!**

A Thesis

Presented to the Department of Psychology

College of Liberal Arts and Sciences

of

Butler University

In Partial Fulfillment

of the Requirements for University Honors

Kristi Michelle Summers

March 23, 2012

### Abstract

The phenomenon of mind wandering involves a situation in which a person's executive control switches from the current task to unrelated thoughts (Smallwood & Schooler, 2006). Previous research has indicated that individuals mind wander more often when they are in negative moods than when they are happier (Killingsworth & Gilbert, 2010; Smallwood, 2009). One theory of mind wandering, the Working Memory Capacity Theory, claims that participants with a lower working memory capacity (WMC) experience more mind wandering during a challenging primary task than participants with a higher WMC because those with higher WMC can better use their executive control to remain on task than individuals with lower WMC (Kane et al., 2007; McVay & Kane, 2009). The current study investigated the relationship between mood and both the frequency and the content of mind wandering. It also expanded upon past research by addressing whether WMC impacts the valence of task unrelated thoughts. Results showed that participants in an unpleasant mood demonstrated more task unrelated mind wandering than those in a pleasant mood, consistent with the past literature. In addition, participants in an unpleasant mood reported more unpleasant thoughts than those in a pleasant mood. When the sample was divided into high and low WMC groups, the low WMC group reported more non-task-related thoughts while completing the word search than the high WMC group. Participants with a lower WMC also demonstrated more negative thoughts than those with a higher WMC particularly when thinking about how they were performing on the word search task.



### **If You're Happy and You Know It: Concentrate!**

Imagine sitting down for a weekly work meeting and, suddenly, you realize that the entire conference room is awaiting a response from you. You frantically wrack your brain trying to remember what discussion was previously taking place, but your mind has been wandering to evening plans. Or perhaps you are in the middle of your Biology final only to realize you have read the same question five times without ever really registering what the question says. In our everyday lives, we often intend to perform a task only to realize a few moments later that our minds have drifted to a different place. Executive control is the cognitive process that helps individuals to perform tasks despite distractors (McVay & Kane, 2009). The phenomenon of mind wandering involves a situation in which executive control switches from the current task to unrelated thoughts (Smallwood & Schooler, 2006).

The prevalence of mind wandering has been difficult to determine in past research. Reported cases of mind wandering range from 33% to 46.9% of thoughts during daily activities and 43% during experimental laboratory tasks (Christoff, Gordan, Smallwood, Smith, & Schooler, 2009; Kane, Brown, McVay, Myin-Germeys, & Kwapil, 2007; Killingsworth & Gilbert, 2010). Generally, individuals are not surprised to realize when they have been mind wandering, yet nearly half are unaware of where their attention has wandered to (Christoff et al., 2009; Kane et al., 2007). Past research has also indicated that individuals' minds are more likely to wander when they are performing a task with cues to their personal lives (McVay & Kane, 2009). These findings seem to indicate that mind wandering is an everyday occurrence, but the exact causes of mind wandering are under debate.

Two of the more prominent theories regarding mind wandering focus on working memory perceptual load and working memory capacity. The Perceptual Load Theory purports a belief that mind wandering depends on the amount of attention available (Forster & Lavie, 2009). This theory claims that mind wandering can be prevented when the primary task involves high working memory perceptual load due to less attention being available for other thoughts. Previous research has indeed supported this theory by finding that increasing perceptual load results in fewer task-unrelated thoughts (Forster & Lavie, 2009; Smallwood, Nind, & O'Connor, 2009).

In contrast, the Working Memory Capacity Theory of mind wandering states that the occurrence of mind wandering depends on individual differences in working memory abilities. Participants with a lower working memory capacity (WMC) are expected to experience more mind wandering during a challenging primary task than participants with a higher WMC (McVay & Kane, 2009) because those with a higher WMC can better use their executive control to remain on task than individuals with a lower WMC (Kane et al., 2007). In a study that tested both the perceptual load and the working memory capacity theories, McVay and Kane (2009) found stronger support for the working memory capacity theory.

Other research has taken a more direct look at the content of mind wandering as well as the relationship between one's mood and the frequency of mind wandering. These studies have demonstrated that people's minds more often wander to pleasant thoughts than to unpleasant or neutral thoughts (Killingsworth & Gilbert, 2010). In scenarios where individuals' performances are not continuously monitored, they are more likely to think about future events rather than the past (Smallwood et al., 2009). In examining the



relationship between mood and mind wandering, Kane et al. (2007) found that individuals tend to mind wander more when they are fatigued, bored, or stressed. Other studies have similarly demonstrated that individuals mind wander more often when they are in less happy, more negative moods than when they are happier (Killingsworth & Gilbert, 2010; Smallwood, Fitzgerald, Lyden, & Phillips, 2009).

Previous research has explored the content of mind wandering and the extent to which mood affects the frequency of mind wandering. However, no previous studies have examined the effect mood exerts on the content of mind wandering. This study investigated the relationship between positive and negative moods and both the frequency and the content of mind wandering. It also expanded upon past research by addressing whether WMC impacts the valence of task unrelated thoughts.

### **Hypotheses**

I had three primary hypotheses regarding the outcomes of this study. The first hypothesis was that, consistent with the past literature, individuals in a positive mood would experience less mind wandering than individuals in a negative mood. My second hypothesis was that a mood congruency effect would emerge such that individuals in a positive mood would report more pleasant thoughts while mind wandering and those in a negative mood would report more unpleasant thoughts during mind wandering. My third hypothesis was that, consistent with previous studies, individuals with a higher WMC would experience less mind wandering than those with a lower WMC. However, this study also examined whether the emotional valence of mind wandering differed based on WMC.

## Method

### Participants

Fifty-three undergraduate students from Butler University participated in this study. I recruited participants from Introductory Psychology courses. Participation required only one 60 minute testing session performed in a group setting with group sizes ranging from five to fifteen. Participants received extra credit in their psychology class as compensation for their time.

### Procedure

Upon arrival at the testing session, participants received a short introduction to the study and then provided their informed consent. Next, the participants performed two working memory capacity tasks: Digit Span and Sentence Span. They then filled out a mood questionnaire before working on a word search task modified to measure mind wandering.

### Materials

Digit Span (Wechsler, 1997): Participants completed the Digit Span subtest from the Wechsler Adult Intelligence Scale-Third edition (WAIS-III) modified for group administration. Participants heard a series of single digits ranging in length from two numbers to nine numbers and then wrote down the sequence in order. The test included two items at each span length. Participants earned one point for each correctly recorded series, with possible total scores ranging from 0 to 16. This score was added to the Sentence Span score to obtain a total WMC score for each participant.

Sentence Span: Participants read short sentences displayed on a series of Power Point slides. One word from each sentence was underlined, and intermittently throughout



the test, the participants wrote down all of the underlined words that they could recall from the previous sentences in order. The underlined words formed complete sentences that increased in length by one word with each trial. The test included four trials of three sentences each. Participants earned one point for each correctly recorded series, with possible total scores ranging from 0 to 12. This score was added to the Digit Span score to obtain a total WMC score for each participant.

Mood Questionnaire: An 8-item questionnaire assessed each participant's mood. Participants rated eight different emotions with regards to how much they were currently experiencing each. (See Appendix A.) Scores for the four negative adjectives (Anxious, Sad, Depressed, and Irritable) were added and then were subtracted from the total of the four positive adjectives (Happy, Cheerful, Content, and Excited). As such, more positive scores indicated a more positive mood, whereas more negative scores reflected a more negative mood.

Word Search Puzzle: Participants completed a word search that consisted of 35 sports-related items. (See Appendix B.) Participants circled list words found in an array of letters. Participants spent twenty minutes working on the word search. A tone interrupted their work six times at unpredictable intervals throughout the task. The tone occurred at intervals between two and four minutes and indicated when the participants should respond to the two thought probes. (See Appendix C.)

When instructed, participants began working on the word search with a pen labeled #1 until they heard the first tone. Upon hearing the tone, they answered two thought probe questions. The first question asked, "What were you just thinking about?" The participants chose from the following: "a) task, b) task performance, c) everyday

stuff, d) current state of being, e) personal worries, f) daydreams, g) other.” Response “a) task” reflected when participants were focusing on task demands. Response “b) task performance” reflected when participants were thinking about how well they were performing on the task. When scoring, responses to choices c through g were combined into task unrelated thoughts. The second question asked, “Were your thoughts: a) pleasant, b) neutral, or c) unpleasant?” After responding to both probes, the participants continued working on the word search using a new pen until the next tone. The participants switched back and forth between working on the word search and answering thought probes as indicated by the tones, using a different pen for each word search interval.

## Results

### The Effect of Mood on Mind Wandering

Based on their responses to the mood questionnaire, I divided participants into a pleasant mood group (mood score range = 1-11;  $n = 34$ ) and an unpleasant mood group (mood score range = -13 to -1;  $n = 19$ ). The two groups were statistically equivalent in age, gender, and WMC. However, the pleasant mood group outperformed the unpleasant mood group on the word search (unpleasant mood  $M = 17.58$ ,  $SD = 5.32$ ; pleasant mood  $M = 20.35$ ,  $SD = 5.80$ ;  $F(1,51) = 2.95$ ,  $p = 0.092$ ). (See Table 1.) Figure 1 shows the frequency of task related, task performance, and task unrelated thoughts for those in a pleasant mood versus those in an unpleasant mood. A one-way ANOVA examined the impact of mood on the frequency of mind wandering. Consistent with the past literature, participants in an unpleasant mood demonstrated more task unrelated mind wandering ( $M = 3.05$ ,  $SD = 1.75$ ) than those in a pleasant mood ( $M = 2.06$ ,  $SD = 1.58$ ;  $F(1,51) = 4.49$ ,  $p$



< .05). (See Figure 3c.) However, participants in an unpleasant mood did not differ from those in a pleasant mood in task related (unpleasant mood  $M = 1.79$ ,  $SD = 1.36$ ; pleasant mood  $M = 2.47$ ,  $SD = 1.64$ ;  $F(1,51) = 2.37$ ,  $p = .130$ ) or task performance thoughts (unpleasant mood  $M = 1.74$ ,  $SD = 1.41$ ; pleasant mood  $M = 1.68$ ,  $SD = 1.55$ ;  $F(1,51) = .020$ ,  $p = .889$ ).

A second one-way ANOVA evaluated the valence of thoughts during the word search for those in a pleasant mood versus those in an unpleasant mood. Participants in an unpleasant mood reported more unpleasant thoughts while completing the word search puzzle ( $M = -1.0$ ,  $SD = 2.26$ ) than those in a pleasant mood ( $M = 0.21$ ,  $SD = 2.07$ ;  $F(1,51) = 3.87$ ,  $p = .055$ ). (See Figure 2.) This pattern of mood congruency was consistent across task focused thoughts (unpleasant mood  $M = -0.10$ , pleasant mood  $M = 0.11$ ;  $F(1,46) = 1.75$ ,  $p = 0.19$ ), thoughts about task performance (unpleasant mood  $M = -0.35$ , pleasant mood  $M = -0.12$ ,  $F(1,38) = 2.08$ ,  $p = 0.16$ ), and task unrelated thoughts (unpleasant mood  $M = -0.11$ , pleasant mood  $M = -0.01$ ,  $F(1,44) = 0.34$ ,  $p = 0.56$ ; see Figure 3). However, when I examined the valence of task, task performance, and task unrelated thoughts across the pleasant and unpleasant mood groups using three separate one-way ANOVAs, the group differences did not reach significance for any of the three types of thoughts.

### **The Effect of Working Memory Capacity on Mind Wandering**

Each participant earned an overall WMC score that consisted of the sum of their total scores on Digit Span and Sentence Span. I used these scores to divide participants into a high WMC group (working memory score range = 21 to 26;  $n = 25$ ) and a low WMC group (working memory score range = 13 to 20;  $n = 28$ ). The two groups were



statistically equivalent in age and gender, but the high WMC group ( $M = 22.2$ ,  $SD = 5.07$ ) outperformed the low WMC group ( $M = 16.82$ ,  $SD = 5.15$ ) on the word search task,  $t(51) = 3.83$ ,  $p < .0001$ . (See Table 2.) Figure 4 shows the frequency of task, task performance, and task unrelated thoughts for those with a higher WMC and those with a lower WMC. A one-way ANOVA examined the impact of WMC on the frequency of mind wandering. Consistent with past studies, the low WMC group reported more task unrelated thoughts ( $M = 3.11$ ,  $SD = 1.64$ ) while completing the word search than the high WMC group ( $M = 1.64$ ,  $SD = 1.41$ ),  $F(1,51) = 12.04$ ,  $p < .01$ . However, the two groups were equivalent in the frequency with which they thought about the task (high WMC group:  $M = 2.52$ ,  $SD = 1.64$ ; low WMC group:  $M = 1.96$ ,  $SD = 1.48$ ;  $F(1,51) = 1.69$ , ns) and their task performance (high WMC group:  $M = 1.92$ ,  $SD = 1.71$ ; low WMC group:  $M = 1.50$ ,  $SD = 1.26$ ;  $F(1,51) = 1.05$ , ns).

A second one-way ANOVA evaluated the valence of thoughts during the word search for those with a higher WMC and those with a lower WMC. Participants with a lower WMC demonstrated similarly valenced thoughts ( $M = -0.64$ ,  $SD = 2.15$ ) to those with a higher WMC ( $M = 0.24$ ,  $SD = 2.20$ ;  $F(1,51) = 2.18$ ,  $p = 0.15$ ; see Figure 5). Lastly, I examined the valence of task, task performance, and non-task thoughts across high and low WMC using three separate independent samples  $t$ -tests. Although the two groups were equivalent in the frequency with which they mind wandered to thoughts about their task performance, the low WMC group reported their thoughts as more unpleasant ( $M = -0.35$ ,  $SD = .39$ ) than the high WMC group ( $M = -0.05$ ,  $SD = .55$ ) when thinking about how they were performing on the word search task,  $t(37) = 1.94$ ,  $p = .06$ . (See Figure 6.) This pattern was present but not significant when the two groups mind wandered to task

unrelated thoughts (high WMC group:  $M = 0.01$ ,  $SD = .62$ ; low WMC group:  $M = -0.09$ ,  $SD = .47$ ;  $t(43) < 1$ , ns).

### Discussion

My study investigated the effect of working memory capacity and mood on the valence and frequency of mind wandering. My first hypothesis addressed how mood affects the frequency of mind wandering. Previous research has indicated that individuals mind wander more often when they are in negative moods than when they are happier (Killingsworth & Gilbert, 2010; Smallwood, 2009). The results of my study support past findings in that participants in an unpleasant mood demonstrated more task unrelated thoughts. However, participants in an unpleasant mood did not differ from participants in a pleasant mood with regards to how often they reported concentrating on the task or how often they were thinking about their performance on the task. This finding indicates that mood does have an impact specifically on the frequency of mind wandering to unrelated thoughts rather than affecting all types of thoughts equally.

I expanded upon this literature by also looking at the valence of thoughts. Past research examining the content of mind wandering has found that individuals tend to think about pleasant thoughts rather than unpleasant or neutral thoughts (Killingsworth & Gilbert, 2010). However, no prior research has looked at the effect mood can have on the content of mind wandering. Therefore, my second hypothesis addressed how mood affects the valence of unrelated thoughts when completing a complex task. My results identified a mood congruency effect in which individuals in a pleasant mood tended to have more positive thoughts while completing the word search than participants in an unpleasant mood, who instead reported more negative thoughts. Past research has



demonstrated that individuals tend to mind wander more when they are fatigued, bored, or stressed (Kane et al., 2007). The findings of my study build on this literature by indicating that individuals experiencing more unpleasant emotional states will not only mind wander more often, but will also have more unpleasant thoughts.

Two prominent theories regarding mind wandering are the Working Memory Capacity Theory (WMC) and the Perceptual Load Theory. The Perceptual Load Theory claims that mind wandering depends on the amount of attention available and that unrelated thoughts can be reduced by increasing working memory perceptual load (Forster & Lavie, 2009; Smallwood, Nind, & O'Connor, 2009). The Working Memory Capacity theory states that individuals with a higher WMC remain on task better than individuals with a lower WMC on activities that require concentration and effort (Kane et al., 2007). My third hypothesis addressed the impact of WMC on the frequency and emotional valence of mind wandering. I designed my study to not only replicate Kane and colleagues' (2007) finding but also to further investigate the impact of WMC on the content of mind wandering. Specifically, my third goal was to determine whether WMC not only affects the frequency of mind wandering but also impacts the valence (i.e., pleasantness) of task related and task unrelated thoughts. My results did replicate past findings that low WMC is associated with increased mind wandering during complex cognitive tasks. In addition, I found that individuals with a lower WMC were more prone to negative mind wandering thoughts, particularly when they were thinking about their task performance.

While my study did not specifically manipulate the complexity of the word search to directly test the Perceptual Load Theory, individuals with a higher WMC presumably



also experience less perceptual load than individuals with a lower WMC. Thus, my findings do not appear to be supportive of the Perceptual Load Theory. However, manipulation of task complexity may have led to individual differences in mind wandering even within high versus low WMC groups. Future studies will be necessary to further examine the validity of the Perceptual Load Theory versus the Working Memory Capacity Theory on mind wandering and to determine whether perceptual load may impact the emotional valence of mind wandering thoughts.

One limitation that may have impacted the results of my study is the specificity of my task. I utilized a lengthy word search in hopes of inducing mind wandering among the participants. However, I did not take into account the amount of interest participants had in completing word searches. Mood could have impacted the enjoyment of the task, and perhaps some individuals enjoyed the word search more than others, thus helping them keep their thoughts focused on the task. In addition, past research has also indicated that individuals' minds are more likely to wander when they are performing a task with cues to their personal lives (McVay & Kane, 2009). Because the word search consisted of sports terms, participants in sports may have tended to mind wander more often than non-athletes. Consequently, the word search task may have induced different thoughts dependent upon the interests of the participant. Future research could expand upon the generalizability of a word search to everyday occurrences of mind wandering.

Sample size and composition may have influenced my results as well. I was unable to differentiate between the different types of task unrelated thoughts (i.e., everyday stuff, current state of being, personal worries, daydreams, or other) due to the rarity with which each occurred in my study, but a larger sample size or a longer task

with more mind wandering probes may have provided enough power to specifically identify the content of mind wandering. Participants in my study were also predominantly female; therefore, gender differences were not possible to distinguish. A greater number of male participants could have helped determine whether gender affects the frequency and valence of mind wandering thoughts.

Another confounding variable involved the expectancy of the thought probes. Participants knew they would be interrupted throughout the word search to answer questions regarding what they were currently thinking about. Expecting this interruption may have caused the participants to have different thoughts than they would otherwise during typical, everyday circumstances. Surprising participants with a single thought probe might circumvent this issue, although it would also limit the ability to identify the frequency of mind wandering more generally. The validity of the thought probes also relied heavily on the participants being able to honestly and accurately evaluate their thoughts in the moment. When reporting their thoughts, some participants may have considered the entire time interval whereas others may have focused specifically on the moment of the thought probe. In addition, past studies have suggested that individuals are not usually surprised to learn they have been mind wandering, but they often are unaware of where their attention has wandered to (Christoff et al., 2009; Kane et al., 2007). Consequently, participants may have struggled to determine their own thought content when responding to the thought probes in this study. Nonetheless, the results of my study were generally consistent with past research on mind wandering and also supported all three of my hypotheses, suggesting that despite these limitations my study was successful at exploring how mood and WMC impact the frequency and content of mind wandering.



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**Appendix A**

Participant ID # \_\_\_\_\_

**Mood Questionnaire**

For each of the following adjectives, please rate the extent to which you presently feel...

	Not At All				Very Much So
Happy	1	2	3	4	5
Anxious	1	2	3	4	5
Cheerful	1	2	3	4	5
Content	1	2	3	4	5
Sad	1	2	3	4	5
Depressed	1	2	3	4	5
Irritable	1	2	3	4	5
Excited	1	2	3	4	5

## Appendix B

## Word Search

Please complete the following puzzle. Do not flip the page or open your questionnaire booklet until further instruction has been given by the experimenter.

S A O B N G E G C C L R S G N I D A E L R E E H C J S J L R  
 K R P S O U A R N L Y N U C N O F P E L R U N N I N G L H U  
 A C X L V T I S A I O D I V I N G D Y A B I X C A I A E P G  
 T H F U T C E B C W L A S L T P B L Z B I M G Y S B X C A B  
 E E Z C K A Y Y B I D W U P R U K F N T L L M G K Y T B F Y  
 B R A E W E T O G U T D O P B V Y L S E L K X C S A P D W C  
 O Y T S L A A X B Y C S L B I A P C Z K I J I W L S J R U M  
 A U F L A R V C U H F L A L F N C N G S A K X T C C Z W B Q  
 R O O Y D S J H C J C F I N A A L Q R A R H Z J W W F A B X  
 D V G I D O D G E B A L L S M B D W I B D W V S K Y J A U Y  
 I E N P J X R G E A Q R H Y M Y E T T Z S M R M F O R D W B  
 N G L N C N V M D Z G X V H A M G S L X G U L E E N V A R X  
 G R Z O E D A Q R N G P Y E D E K G A X G M G I S X A Q Q W  
 S Z S Y O L O P I U N W D K J F X Y I B V T Q B R T R V T Z  
 S C A F E G T C F D I Z M R B R J O L R X J V I U P L U R H  
 Q H P L K K N V I A W Z X R I F T Z K H Z D L I J L X I W U  
 K N V L P A C E B Z O B G N I X O B C O A V Q A Q R Z U N M  
 N Q S A D R M O K O R R Z R T J E M H X L H F I C T F J F G  
 A Y Z B N C H M H K J W V K K T G E H R D T B E F R K V R G  
 U K B T X P U K J R T S U I X N Y J V D I S F R N Q O K S S  
 B K X F T L F Y P A K D N E P J K C M X J B G Q Y C V S B L  
 D F O O T B A L L C P A X T T J F H Y P A G N I M M I W S J  
 L W X S K T H C R I N L R N A X E Q X D B L I T Z T I N W E  
 F G D D U R T P K N Y S V A A R E V M Z B O L G B B B M G Q  
 V I E G G T D B S G X P F C T G N I F R U S C G T R F U M N  
 S B L O A F D I E M J K P T V E N G Q G K W Y Y F Q O L M C  
 W S A G E X N O T T D K A T X T T B K I U W C V H C M N Y D  
 R K Y H Y N T X V H X W Q X O A Z I I W K L M C T M J T F X  
 P Q Z S E K A T W U Q X P N F Y Q N R I Q K C G M N A P E K  
 V I U T J O K E N M Z U B C Q P G N F A N V I Q U V I A T W

ARCHERY  
 BADMINTON  
 BASEBALL  
 BASKETBALL  
 BILLIARDS  
 BOWLING  
 BOXING  
 CHEERLEADING  
 CRICKET

CYCLING  
 DANCING  
 DIVING  
 DODGEBALL  
 FENCING  
 FOOTBALL  
 GOLF  
 GYMNASTICS  
 HOCKEY

KARATE  
 KICKBALL  
 LACROSSE  
 POLO  
 RACING  
 ROWING  
 RUGBY  
 RUNNING  
 SKATEBOARDING

SKIING  
 SNOWBOARDING  
 SOFTBALL  
 SURFING  
 SWIMMING  
 TENNIS  
 VOLLEYBALL  
 WRESTLING

**Appendix C**

## Example of a Thought Probe Item

Thought Probe 1:

What were you just thinking about?

- a) task
- b) task performance
- c) everyday stuff
- d) current state of being
- e) personal thoughts
- f) daydreams
- g) other

Were your thoughts?

- a) pleasant
- b) neutral
- c) unpleasant



Table 1

*Demographics and Task Scores by Mood*

	Pleasant Mood <i>N</i> = 34	Unpleasant Mood <i>N</i> = 19
Age	18.44 (0.705)	18.32 (0.582)
Gender (% F)	89	82
WM Total	20.50 (3.32)	19.95 (3.87)
Word Search	20.35 (5.80)	17.58 (5.32)

Table 2

*Demographics and Task Scores by WMC*

	High WMC <i>N</i> = 25	Low WMC <i>N</i> = 28
Age	18.44 (0.821)	18.36 (0.488)
Gender (% F)	76	93
WM Total	23.28 (2.64)	17.65 (3.68)
Word Search	22.20 (5.07)	16.82 (5.15)

Figure 1

*Total Number of (a)Task, (b)Task Performance, and (c)Task Unrelated Thoughts by Mood*

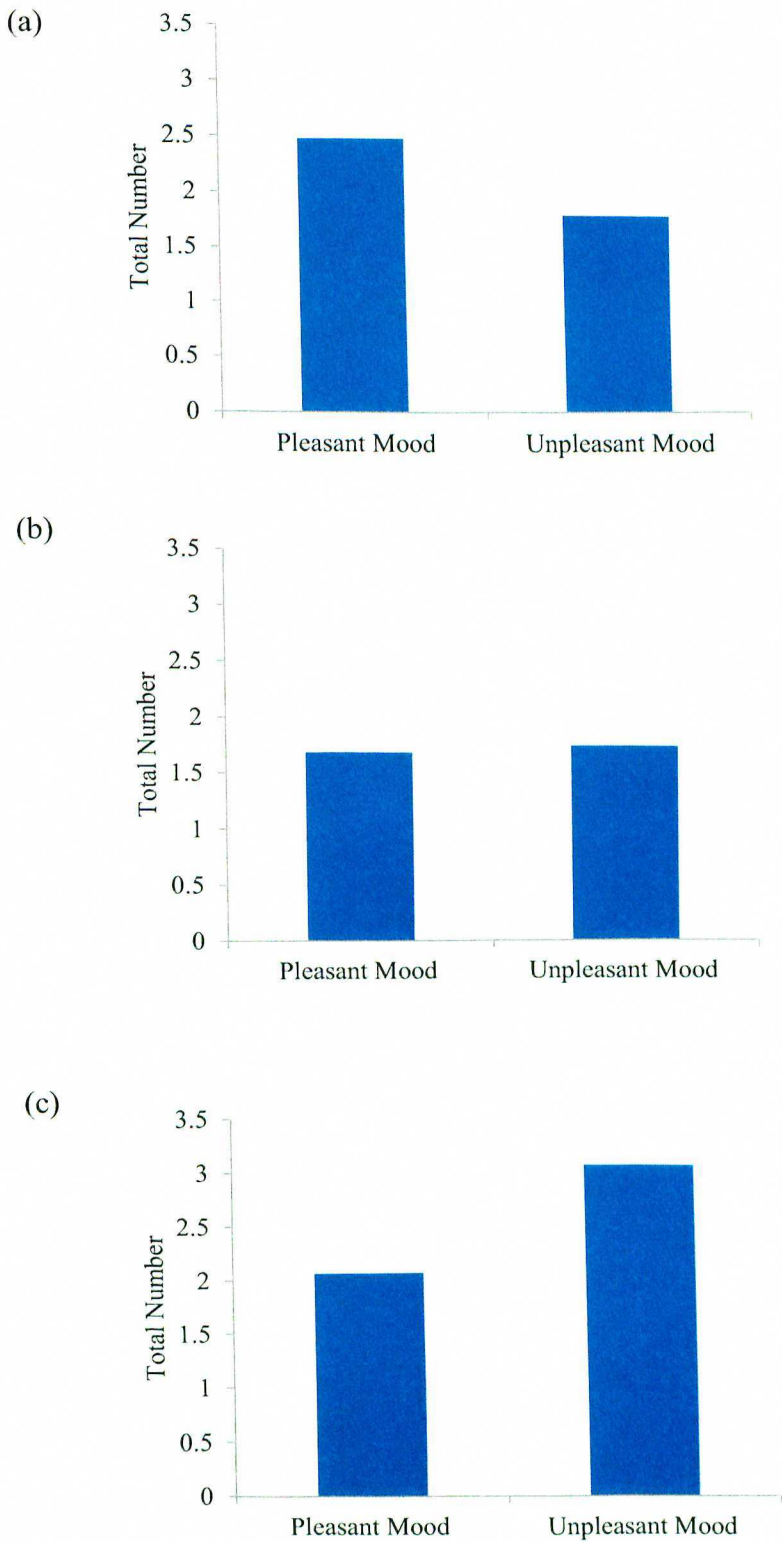




Figure 2

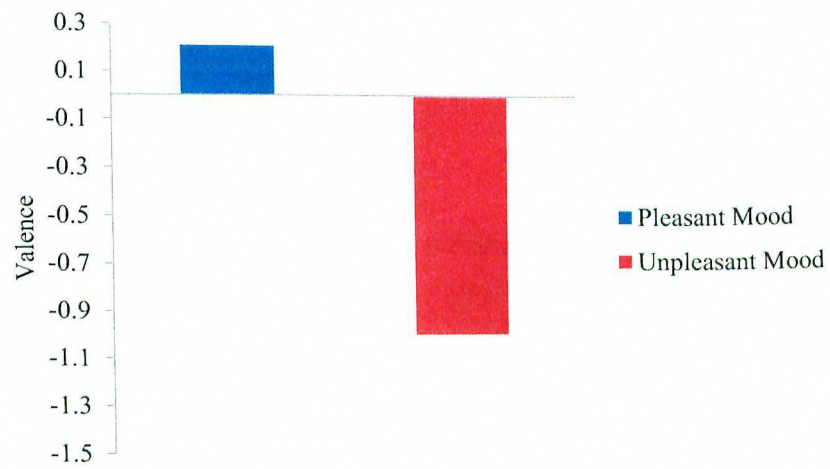
*Valence of All Thoughts by Mood*

Figure 3

*Valence of (a)Task, (b)Task Performance, and (c)Task Unrelated Thoughts by Mood*

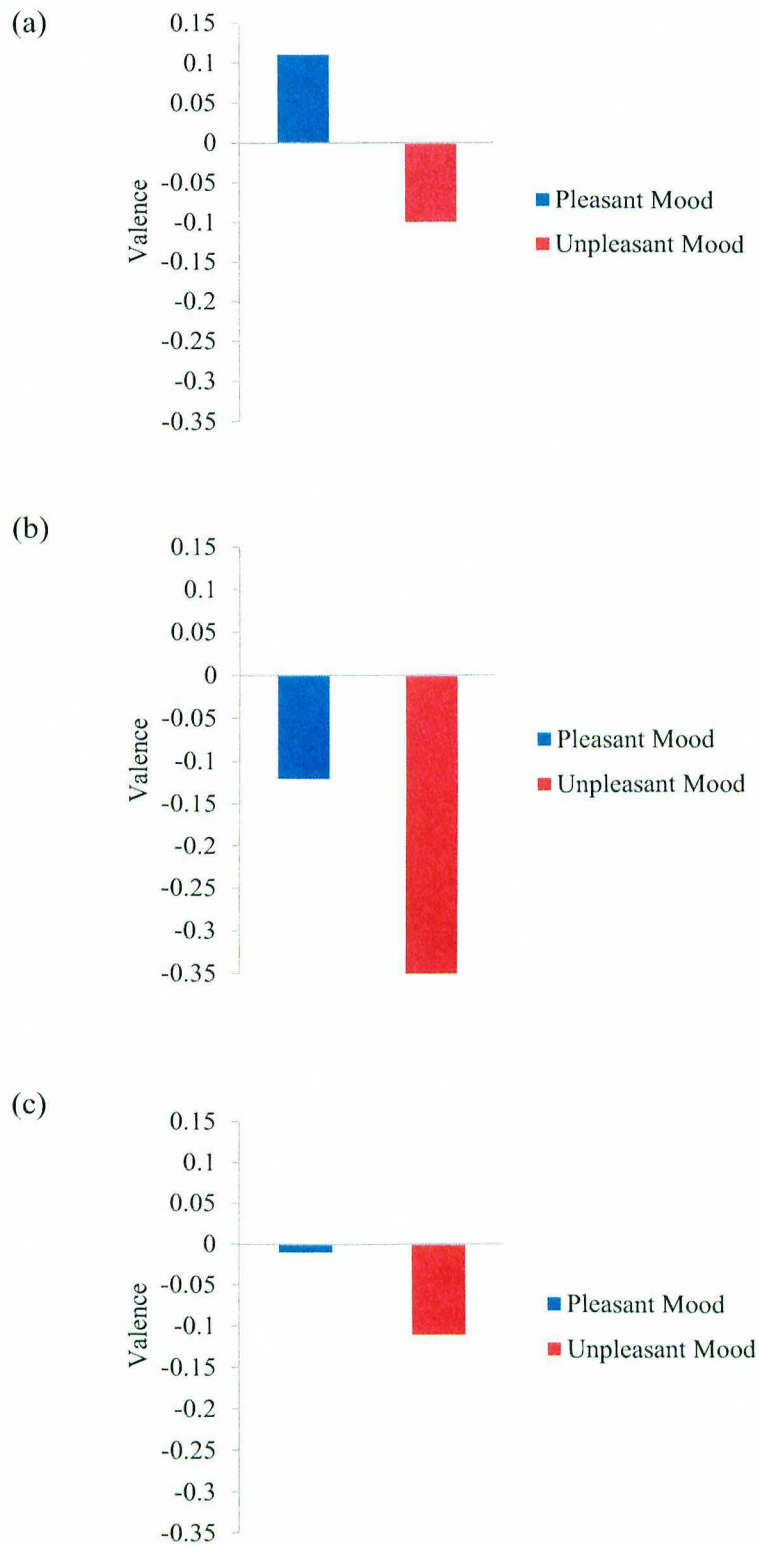


Figure 4

*Total Number of (a)Task, (b)Task Performance, and (c)Task Unrelated Thoughts by WMC*

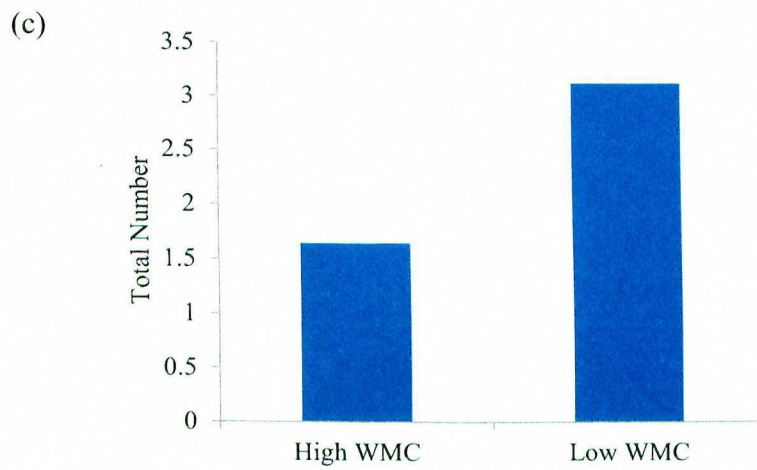
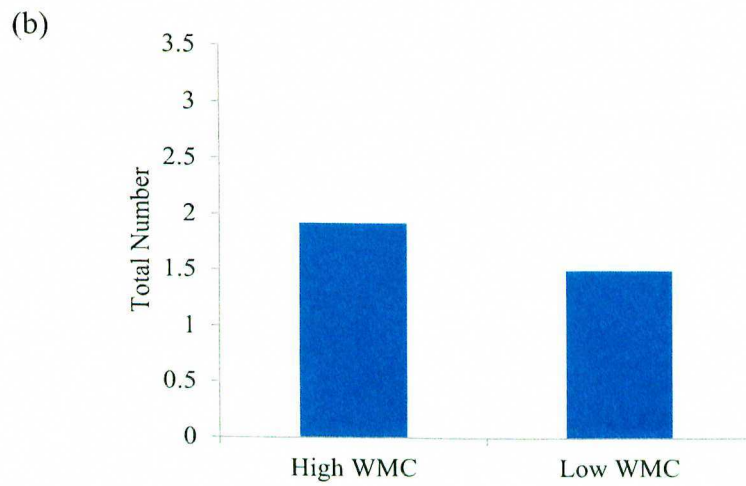
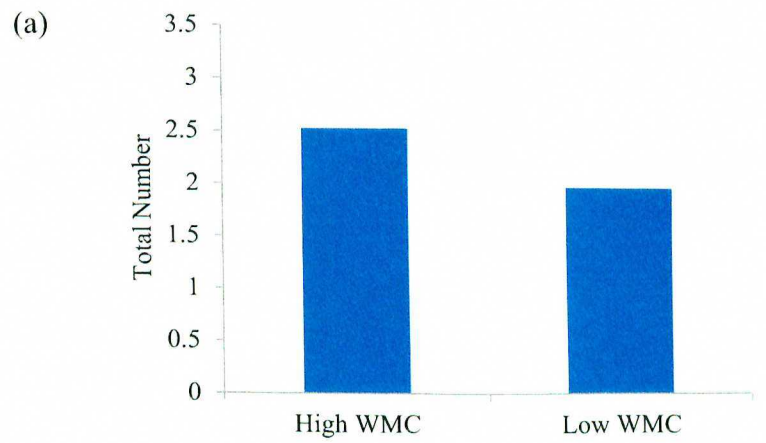




Figure 5

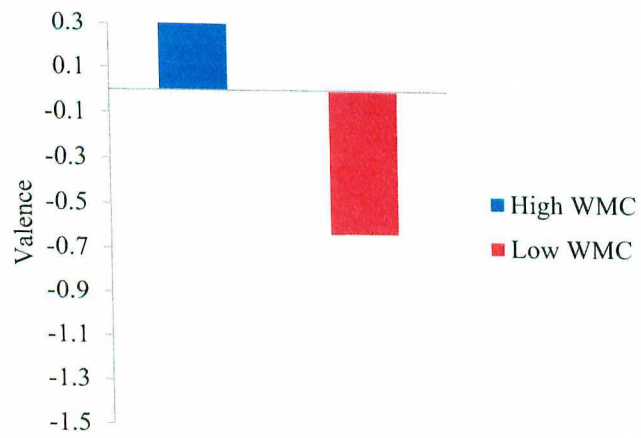
*Valence of All Thoughts by WMC*

Figure 6

*Valence of (a) Task, (b) Task Performance, and (c) Task Unrelated Thoughts by WMC*

